

Amendments to the Drawing

Applicants enclose herewith a replacement sheet of the drawing in accordance with 37 C.F.R. 1.121(d) which provides FIG. 1 on a separate page. The replacement sheet replaces the original sheet which was not on a separate page.

Enclosure: Replacement Sheet

REMARKS

In the Office Action mailed on December 10, 2007, the Examiner objected to the drawing as not being on a separate page. In addition, the specification was objected to for containing two paragraphs in the abstract. Claims 1-3 and 5-6 were rejected under 35 U.S.C. § 102(b) over US 5,985,391 ("Denehy"). Claims 1-4 were rejected under 35 U.S.C. § 102(b) over US 2001/0031348 ("Jud"). Claims 1-6 were rejected under 35 U.S.C. § 112 first paragraph for lack of enablement for the barrier layer. Claims 1-6 were rejected under 35 U.S.C. § 112 second paragraph for indefiniteness.

By means of the present Amendment, changes to the specification, drawings and claims have been introduced. Specifically a replacement drawing in accordance with 37 C.F.R. 1.121(d), a marked-up version and a clean version of a Substitute Specification in accordance with 37 C.F.R. 1.121(b)(3) and 1.125; and a new claim listing are enclosed for the Examiner's consideration.

Support for these amendments can be found in the originally-filed application, such as, for example, on page 1, paragraph 3, line 1. No new matter has been introduced.

In view of the replacement drawing, Substitute Specification, amendments to the claims, together with the following remarks, Applicants respectfully request reconsideration and withdrawal of all grounds of rejection and objection.

Objection to the drawing

The Examiner objected to the drawing as not being on a separate page. Applicants enclose herewith a replacement drawing in accordance with 37 C.F.R. 1.121(d) which provides FIG. 1 on a separate page. As a result, Applicants request reconsideration and withdrawal of the objection to the drawings.

Objection to the Specification

The specification was objected to for containing two paragraphs in the Abstract. Applicants enclose herewith a Substitute Specification (see the enclosed marked-up and clean versions), in which the second paragraph of the Abstract has been deleted.

Additionally, the Substitute Specification provides corrections to translation errors that occurred in the previously filed English language translation of the specification. For example, the term "cross-linking 2K primers" in line 1 of the third paragraph on page 1 has been replaced throughout with the term "cross-linking two-component primers." 2K is a commonly used abbreviation in Germany for the term "Zwei-Komponenten" which can be translated to "two-component." The inaccurately translated term "polyethylene of increased density" as in paragraph 3 on page 3 has been replaced throughout with the term "high density polyethylene." To avoid ambiguous interpretation, the term "sealing foil" as in the first paragraph of page 1 has been replaced throughout with the term "composite film for sealing."

In view of the amendments to the Abstract of the Specification, Applicants respectfully request reconsideration and withdrawal of the objection.

Rejection of Claims 1-3 and 5-6 Under 35 U.S.C. § 102(b)

Claims 1-3 and 5-6 were rejected under 35 U.S.C. § 102(b) over Denehy. Amended independent claim 1 recites in-part a composite film including "a substrate, a primer layer and at least one extruded functional layer ... wherein the primer layer comprises a cross-linking two component primer." Applicants respectfully submit that Denehy fails to teach this element of Applicants' claim 1, and thus fails to anticipate Applicants' claims.

Denehy discloses a carrier release sheet containing a top and bottom skin layer and a barrier layer in between. See figures 1 and 3 and column 3 line 65 to column 4 line 5. The barrier layer between the skin layers can be formed of styrene monomer resin. See column 4, lines 46-49. Chopped glass fiber 24 can be deposited onto or admixed within the styrene monomer resin. See figure 3 and column 5 line 66 to column 6 line 1.

Applicants respectfully submit that Denehy fails to teach or suggest Applicants' claimed primer layer. The styrene monomer layer as disclosed in Denehy can not include a cross-linking two component primer because it only includes one component in the cross-linking i.e. styrene. Therefore, Applicants respectfully submit that Denehy fails to teach or suggest every element of Applicants' amended independent claim 1. Accordingly, Applicants request that the rejection of claim 1 in view of Denehy be withdrawn.

For the reasons stated above, Applicants respectfully submit that amended independent claim 1 is patentable over Denehy. Amended claims 3, 5 and 6 depend directly from claim 1. Therefore, Applicants respectfully submit that amended claims 3, 5 and 6 are also patentable over Denehy. Reconsideration and withdrawal of the rejection is respectfully requested.

Rejection of Claims 1-4 Under 35 U.S.C. § 102(b)

Claims 1-4 were rejected under 35 U.S.C. § 102(b) over Jud. Amended claim 1 recites “wherein the primer layer comprises a cross-linking two component primer.” Applicants respectfully submit that Applicants’ claim 1 is patentable over Jud, at least because Jud fails to teach or suggest Applicants’ claimed primer layer.

Jud discloses a sterilisable composite film containing a barrier layer, a metal foil, and on both sides of the barrier layer, at least one functional layer. See figures 1 and 2 and paragraph [0001]. Nowhere within the disclosure does Jud teach or suggest a primer layer. Moreover, Jud fails to teach or suggest a primer layer that includes a cross-linking two component primer as required by Applicants’ claim 1.

Accordingly, Applicants respectfully submit that amended independent claim 1 is patentable over Jud. Amended claims 3 and 4 depend directly from claim 1. Therefore, Applicants respectfully submit that amended claims 3 and 4 are also patentable over Jud. Reconsideration and withdrawal of the rejection is respectfully requested.

Rejection of Claims 1-6 Under 35 U.S.C. § 112 first paragraph

Claims 1-6 were rejected under 35 U.S.C. § 112 first paragraph for lack of enablement for the barrier layer. The Examiner asserts that one of ordinary skill in the art would not know how to create a barrier layer as claimed without undue experimentation. Applicants respectfully traverse.

Applicants enclose herewith, as part of a supplementary information disclosure statement, an excerpt from a German textbook titled “Verpackung mit Kunststoffen” authored by Otto E. Ahlhaus published in 1997. Section 5.5.2.1 on pages 87-89 discloses several variants of polyethylene. The paragraph on page 88 under the drawing specifically discloses the use of high density polyethylene as a barrier layer with a typical density greater than 0.93 g/cm³ and typical

crystallinity of 60-80% or beyond. The last row of Table 5.6 on page 89 provides further specific details.

A person of ordinary skill in the art would have had access to this knowledge because the book was published before the priority date of the instant application. In view of the state of the art at the time the application was filed, a person of ordinary skill would have been able to make and use the barrier layer as claimed without undue experimentation. Therefore, Applicants respectfully submit that the specification, in view of the knowledge available to one skilled in the art, provides enablement for the barrier layer. Reconsideration and withdrawal of the rejection are respectfully requested.

Rejection of Claims 1-6 Under 35 U.S.C. § 112 second paragraph

Claims 1-6 were rejected under 35 U.S.C. § 112 second paragraph for indefiniteness. Specifically, claim 1 and its dependent claims were rejected under 35 U.S.C. § 112, second paragraph for reciting the term “sealing foil” and for reciting the terms “at least one extruded functional layer” as well as “the extruded layer.” Claim 2 was rejected for using the indefinite term “good properties.” Claims 4 and 5 were rejected for reciting the term “compatibility agent” and claim 6 was rejected for reciting the term “increased density.”

To address the Examiner’s concerns with respect to claim 1, Applicants have amended the claim to replace the term “sealing foil” with “composite film for sealing.” This amendment is supported by the specification as originally filed, at for example, page 2, paragraph 2 and further clarifies Applicants’ claimed invention. In addition the term “the extruded functional layer” has been amended to “the at least one extruded functional layer.” Applicants believe that these amendments address all of the Examiner’s concerns with claim 1 and thus request that this rejection be reconsidered and withdrawn.

Applicants have cancelled claim 2, thereby rendering any rejection against this claim moot.

Claims 4 and 5 were rejected for reciting the term “compatibility agent.” The Examiner asserts that the term “compatibility agent” renders the claims indefinite because one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Applicants respectfully traverse.

Applicants enclose herewith, as part of a supplementary information disclosure statement, excerpts from a German textbooks (1) titled "Polymer-Werkstoffe" authored by Gottfried W. Ehrenstein published 1999, pages 94-95, and (2) titled "Kunststoff Recycling" edited by L. Wolters published 1997, pages 161-164 respectively. As disclosed in book (1), section 4.2 "Heterogeneous Polymer Materials" on page 95 below the figure, "Verträglichmacher" or "compatilizer" translated into English as a "compatibility agent" is defined as a substance or agent which should reduce the surface tension in the boundary layer, allow for a fine dispersion during the mixing process, provide a means for avoiding coarse separation during processing to the final product, and improve the adhesion at the boundary layer. Moreover, the term "Verträglichmacher" is synonymous with the terms "Verträglichkeitsverbesserer" or "Verträglichkeitsvermittler" as used in the original German patent application.

A person of ordinary skill in the art would have had access to this knowledge because both the above textbooks were published before the priority date of the instant application. Applicants respectfully submit that the specification, in view of the knowledge available to one skilled in the art, provides enough support to define the term "compatibility agent." Therefore, reconsideration and withdrawal of the rejection are respectfully requested.

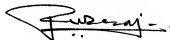
With respect to claim 6, Applicants have corrected a translational error and have amended the term "polyethylene of increased density" to "high density polyethylene." Applicants believe that this amendment addresses and cures any deficiency and thus request that the 35 USC 112, second paragraph rejection be reconsidered and withdrawn.

In view of the above reasons and amendments, Applicants respectfully request reconsideration and withdrawal of the 35 USC 112, second paragraph rejection.

CONCLUSION

In view of the foregoing, Applicants respectfully submit that claims 1 and 3-6 are in condition for allowance and request favorable action. The Examiner is welcome to contact Applicants' agent at the number below with any questions.

Respectfully submitted,



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Sealing-Foil Composite Film for Sealing with Barrier Layer

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a National Phase Application of International Application No. PCT/2003/008017, filed on July 23, 2003, which claims the benefit of and priority to German patent application no. DE 102 35 583.5, filed on August 3, 2002, which is owned by the assignee of the instant application. The disclosure of each of the above application is incorporated herein by reference in their entirety.

BACKGROUND OF THE INVENTION

[0002] The invention relates to a sealing-foil-composite film for sealing with a substrate, a primer layer and at least one extruded functional layer.

[0003] As a rule, sealing foils whose substrates comprise for example aluminium, plastic or paper have a primer layer as an adherent surface for extrusion coatings. The functional layers applied by extrusion are for example weld layers, seal layers or peel layers.

[0004] In particular, if cross-linking 2K-two-component primers are used as an adherent surface for extrusion coatings, there is a danger of undesirable migration occurring between the extrusion coatings and the primer layer. Components of the primer which can migrate, which components can occur as long as the primer is not yet cross-linked or has not reacted, can cause interference with the properties of the functional layers (weld, seal or peel properties) or interference with additive functions such as for example sliding properties or antistatic properties. Furthermore, interference with, or changes in, the primer curing and/or primer properties or interfacial bonding may occur. Such migration occurs in particular if functionalised-functionalized polymers, copolymers and/or blends with low crystallinity, incompatible components and/or greater solubility are used for migrateable components. As a rule, these polymers have a greater tendency to migrate than non-modified polymers, as is for example documented by the difference

in lubricant migration in polyethylene or its copolymers. In particular, peelable functional layers are very receptive to migration, permeability, solubility and diffusivity.

[0005] Based on the state of the art described above, it is the object of the present invention to provide a sealing foil composite film for sealing in which undesirable migration of components of the primer layer and/or the functional layer which have/has a negative effect of the packaging function are/is avoided.

SUMMARY OF THE INVENTION

[0006] According to the invention, the previously derived and shown object is met in that between the primer layer and the extruded functional layer an extruded barrier layer is provided which prevents at least the migration of components of the primer layer and/or of the functional layer. By arranging such a barrier layer between the primer layer and the functional layer, migration within the composite structure is at least reduced as a result of which a sealing foil composite film for sealing is provided which is simple to produce and which makes it possible to use primer systems with fast curing rates or with good adhesive properties, which primer systems could not hitherto be used because of their increased tendency to migrate.

[0007] For example, because of shorter curing times of the primer, this sealing foil composite film for sealing provides improved economy and improved and enhanced product safety.

[0008] By the barrier layer according to a first embodiment comprising good properties of adhering to the primer layer, the layer system according to the invention can be provided in a very simple way.

[0009] If the adhesive properties of the barrier layer on the primer layer cannot easily be reconciled with the barrier effect, then for the purpose of bringing about the

adhesive properties, advantageously a bonding agent layer is provided between the primer layer and the barrier layer.

[0010] The provision of a compatibility agent layer between the barrier layer and the functional layer clearly expands the spectrum of the materials which can be used for the barrier layer.

[0011] Extrusion coating in a single work step is ensured by the barrier layer and/or the bonding agent layer and/or the compatibility agent layer according to an advantageous embodiment of the invention being coextruded with the functional layer.

[0012] The barrier plastic for producing the barrier layer provided according to the invention is to be selected in a targeted way according to the expected migrateable components of the layers. In particular high-density polyethylene of increased density, polyester, polyamide or a filled polymer is suitable as a polymer for the barrier layer provided according to the invention.

[0013] There are a multitude of possibilities of designing and improving the sealing foil-composite film for sealing according to the invention. To this effect we refer for example on the one hand to the subordinate claims of claim 1, and on the other hand to the description of a preferred embodiment in conjunction with the drawing.

DETAILED DESCRIPTION OF THE INVENTION

[0014] In the drawing, the sole Figure shows a section through an embodiment of a sealing foil-composite film for sealing according to the invention.

[0015] The embodiment, shown in the sole Figure, of a sealing foil-composite film for sealing 1 according to the invention comprises a substrate 2, which in the embodiment shown comprises aluminium. This substrate 2 comprises a primer layer 3 as an adherent

surface for the extrusion coating. As an alternative, the substrate can for example also comprise a polyester film.

[0016] In the embodiment shown, extrusion coating has taken place by coextruding a barrier layer 4 provided according to the invention, a compatibility agent layer 5, and a functional layer 6.

[0017] In order to improve or modify the adhesive properties between the primer layer 3 and the barrier layer 4, a bonding agent layer (not shown), arranged between said two layers, can additionally be used, with said bonding agent layer preferably being coextruded with the barrier layer 4, the compatibility agent layer 5 and the functional layer 6.

[0018] The arrangement according to the invention of a barrier layer 4 between the primer layer 3 and the functional layer 6 has an additional effect in that under certain circumstances expensive functional layers, for example comprising peel mixtures, can at least partially be replaced by the relatively more economical barrier material.

[0019] Unlike the embodiment of a sealing-foil-composite film for sealing 1 according to the invention, shown in the embodiment depicted in the sole Figure, it is possible to use two or several functional layers instead of, as shown, only one functional layer 6, in order to adapt the sealing-foil-composite film for sealing 1 according to the invention to its purpose of application.

ABSTRACT

The invention ~~relates to~~ provides a sealing foil composite film for sealing with a substrate (2), a primer layer (3) and at least one extruded functional layer (6). Such a sealing foil composite film for sealing is improved with a view to suppressing migration in that between the primer layer (3) and the extruded functional layer (6) an extruded barrier layer (4) is provided which prevents at least the migration of components of the primer layer (3) and/or of the functional layer (6).

~~The sole Figure 5 has been provided for publication with the abstract.~~